

WHAT IS CLAIMED AS NEW AND IS DESIRED TO BE SECURED BY LETTERS  
PATENT OF THE UNITED STATES IS:

1. A method of producing a mold, comprising steps of:

filling a cavity of a mold assembly with resin so as to form at least one surface of the mold in a predetermined shape with at least one transfer surface of the cavity; and

cooling the resin filled in the cavity so as to solidify the resin;

wherein when the resin in the cavity is cooled, as the resin in the cavity shrinks and a pressure in the cavity becomes lower than a pressure of an atmospheric air guided through a communicating path communicating a surface of a molding insertion member that forms another surface of the mold other than the surface formed in the predetermined shape by the at least one transfer surface of the cavity, at a side opposite to a cavity side and outside of the mold assembly, the atmospheric air is sucked into the communicating path toward the molding insertion member and the molding insertion member is dent toward the cavity so as to form a sink at the another surface of the mold and to bring the at least one surface of the mold into tight contact with the at least one transfer surface of the cavity.

2. The method according to claim 1, further comprising a step of injecting pressure fluid through the communicating path so as to further dent the molding insertion member.

3. The method according to claim 1, further comprising a step of injecting fluid for cooling the resin through the communicating path so as to further dent the molding insertion member.

4. A method of producing a mold, comprising steps of:

filling a cavity of a mold assembly with resin so as to form at least one surface of the mold in a predetermined shape with at least one transfer surface of the cavity;

cooling the resin filled in the cavity so as to solidify the resin;

sucking into the mold assembly either one of air, pressure fluid, and fluid for cooling the resin toward a molding insertion member, that forms another surface of the mold other than the surface formed in the predetermined shape by the at least one transfer surface of the cavity, through at least one communicating path, that communicates a surface of the molding insertion member at a side opposite to a cavity side and outside of the mold assembly, by moving the another insertion piece in a direction separating from the molding insertion member such that the molding insertion member is dent toward the cavity so as to form a sink at the another surface of the mold and to bring the at least one surface of the mold into tight contact with the at least one transfer surface of the cavity.

5. A method of producing a mold, comprising steps of:

filling a cavity of a mold assembly with resin so as to form at least one surface of the mold in a predetermined shape with at least one transfer surface of the cavity and to deform a molding insertion member, that forms another surface of the mold other than the surface formed in the predetermined shape by the at least one transfer surface of the cavity and that includes a convex portion protruding toward the cavity, such that the convex portion of the molding insertion member is substantially flat;

by cooling the resin filled in the cavity so as to solidify and shrink the resin, restoring the convex portion of the molding insertion member so as to form a sink at the another surface of the mold and to bring the at least one surface of the mold into tight contact with the at least one transfer surface of the cavity.

6. A method of producing a mold, comprising steps of:

filling a cavity of a mold assembly with resin so as to form at least one surface of the mold in a predetermined shape with at least one transfer surface of the cavity and to deform a molding insertion member, that forms another surface of the mold other than the surface formed in the predetermined shape by the at least one transfer surface of the cavity, according

to a shape of a concave portion of a holding insertion piece that holds the molding insertion member;

by cooling the resin filled in the cavity so as to solidify and shrink the resin, restoring the molding insertion member such that the resin in the cavity is pressed by the restored molding insertion member so as to press the resin in the cavity to bring the at least one surface of the mold into tight contact with the at least one transfer surface of the cavity.

7. The method according to claim 1, further comprising a step of unlocking a locking block that locks and unlocks a holding insertion piece for holding the molding insertion member for taking out the holding insertion piece, the molding insertion member, and the mold from the mold assembly.

8. The method according to claim 4, further comprising a step of unlocking a locking block that locks and unlocks a holding insertion piece for holding the molding insertion member for taking out the holding insertion piece, the molding insertion member, and the mold from the mold assembly.

9. The method according to claim 5, further comprising a step of unlocking a locking block that locks and unlocks a holding insertion piece for holding the molding insertion member for taking out the holding insertion piece, the molding insertion member, and the mold from the mold assembly.

10. The method according to claim 6, further comprising a step of unlocking a locking block that locks and unlocks a holding insertion piece for holding the molding insertion member for taking out the holding insertion piece, the molding insertion member, and the mold from the mold assembly.

11. The method according to claim 7, further comprising a step of injecting fluid between the molding insertion member and the mold through a fluid guiding path that is

provided in the holding insertion piece so as to separate the molding insertion member from the mold.

12. The method according to claim 8, further comprising a step of injecting fluid between the molding insertion member and the mold through a fluid guiding path that is provided in the holding insertion piece so as to separate the molding insertion member from the mold.

13. The method according to claim 9, further comprising a step of injecting fluid between the molding insertion member and the mold through a fluid guiding path that is provided in the holding insertion piece so as to separate the molding insertion member from the mold.

14. The method according to claim 10, further comprising a step of injecting fluid between the molding insertion member and the mold through a fluid guiding path that is provided in the holding insertion piece so as to separate the molding insertion member from the mold.